February 27, 1845.

SIR JOHN WILLIAM LUBBOCK, Bart., V.P. and Treas. in the Chair.

"An Account of Compact Aluminum." By Professor F. Wöhler of Göttingen, in a Letter to Thomas Graham, Esq. Communicated by Thomas Graham, Esq., F.R.S.

The author has lately found, contrary to the results of his former researches on aluminum made eighteen years ago, that this metal is readily fusible, and that in its reduction from the chloride of aluminum by means of potassium, it presents itself in the form of fused globules, generally so small that their shape is not distinguishable under the microscope, although occasionally they are met with having a sensible diameter. He effects the reduction at once in a clay crucible, the bottom of which he covers with pellets of pure potassium, and places upon these the chloride of ammonium, covering the whole with chloride of potassium in powder. The crucible being then closed up, and heated in a coal fire, the reduction is instantly effected.

Fused aluminum has the colour and lustre of polished tin; it continues perfectly white in the air; it is fully malleable, and the globules may be beaten out into the thinnest plates without cracking at the edges. It is entirely unmagnetic. In other respects the metal in this compact state has the properties which the author formerly ascribed to it.

March 6th, 1845.

The MARQUIS OF NORTHAMPTON, President, in the Chair.

"Essays on Hygrometry and Barometry." By Captain Shortrede, F.R.A.S., First Assistant in the General Trigonometrical Survey of India. Communicated by Lieut.-Col. W. H. Sykes, F.R.S.

This paper commences with an account of the various investigations of the author on subjects relating to the elasticity of aqueous vapour at different temperatures and under different circumstances. He first discusses the tables given by different experimentalists of the force of vapour at various temperatures, and endeavours to deduce an analytical formula giving the nearest approximation to the results recorded. He then proceeds to the consideration of what he terms "the moist bulb problem," or the point of maximum depression attained by a thermometer with a moistened bulb exposed to evaporation in air: he deduces formulæ which he compares with the results of actual observation, and points out the probable sources of error in the cases in which he finds disagreements between them. In the miscellaneous remarks which form the next section of the paper, the author states his reasons for dissenting altogether from the views taken by Dalton of the constitution of mixed gases, or of

mixtures of aqueous vapour with any of the gases, according to which, each gaseous body is uniformly diffused throughout the whole space, its particles repelling those of its own kind, but exerting no pressure on the particles of any other kind. He considers the fact that a given portion of air has its volume expanded by the addition of aqueous vapour, as being of itself a sufficient refutation of that theory. The author then takes occasion to discuss the question, whether aqueous vapour exists in the atmosphere in the state of mechanical mixture or of chemical solution, and argues in favour of the latter view of the subject.

In the concluding section, the author enters at large into the investigation of the method of ascertaining heights by barometric observations, and gives various tables to be used for that purpose.

April 3, 1845.

The MARQUIS OF NORTHAMPTON, President, in the Chair.

'Αμόρφωτα, No. 2. "On the Epipolic Dispersion of Light; being a Supplement to a paper entitled 'On a case of Superficial Colour presented by a Homogeneous Liquid internally colourless.'" By Sir John Frederick William Herschel, Bart., F.R.S. &c.

The author inquires whether the peculiar coloured dispersion of white light intromitted into a solution of sulphate of quinine, is the result of an analysis of the incident light into two distinct species, or merely of a simple subdivision analogous to that which takes place in partial reflexion, as exemplified in the colours of thin plates. He endeavours to ascertain the laws which regulate this singular mode of dispersion, which for brevity he terms *epipolic*, on account of the proximity of the seat of dispersion to the intromitting surface of the fluid. It might have been expected that by passing the same incident beam successively through many such dispersive surfaces, the whole of the blue rays would at length be separated from it, and an orange, or red residual beam be left: but the author establishes, by numerous experiments, the general fact, that an *epipolical beam of light*, meaning thereby a beam which has been once transmitted through a quiniferous solution, and undergone its dispersing action, is incapable of farther undergoing epipolic dispersion.

There were only two liquids, out of all those examined by the author, namely oil of turpentine and pyroxylic spirit, which, when interposed in the incident beam, act like the solutions of quinine in preventing the formation of the blue film: and the only solid in which the author discovered a similar power of epipolic dispersion, is the green fluor of Alston Moor, and which by this action exhibits at its surface a fine deep blue colour.
